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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Laurence M.C. Lai

R029 1559/US

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WOMBLE CARLYLE SANDRIDGE & RICE, PLLC

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EXAMINER

ALANKO, ANITA KAREN

ART UNIT

PAPER NUMBER

1792

MAIL DATE

DELIVERY MODE

11/01/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

09/989,898

Applicant(s)

LAI ET AL.

Examiner

Anita K. Alanko

Art Unit

1792

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 25-58 is/are pending in the application.
- 4a) Of the above claim(s) 40, 43-48, 50 and 52-58 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 25-39, 41, 42, 49, 51 and 52 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 1/9/07 (and 5/3/07) has been entered.

Election/Restrictions

Applicant's election of Species i in the reply filed on 8/7/07 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 25-39, 42, 49 and 52 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reilly et al (US 4,583,099) in view of Beckett (US 5,340,436) and Lichtblau (US 3,913,219).

Reilly discloses a method comprising:

applying a first etch-resistant pattern ("masking" step, col.11, line 43) to a first metal-containing layer (aluminum, col.11, lines 41-42) of the web (polyethylene, col.11, line 42), the first metal-containing layer being disposed on a first surface ("aluminum ...laminated on each surface" col.11, lines 43-45) of a substrate consisting essentially of a polymer film (polyethylene), the first metal-containing layer being about one-half of a desired feature thickness (2 mils, col.11, line 45), wherein at least a portion of the first pattern substantially defines a first part of the functional feature of the product unit (Example II, distributed capacitance);

applying a second etch-resistant pattern ("masking" step occurs on both surfaces, so the second surface comprises a second pattern, col.11, line 43) to a second metal-containing layer (aluminum, col.11, lines 41-42) of the web (polyethylene, col.11, line 42), the second metal-containing layer being disposed on a second surface of the substrate opposite the first surface ("aluminum ...laminated on each surface" includes an opposite surfaces, col.11, lines 43-45), the second metal-containing layer being about one-half of a desired feature thickness (2 mils, col.11, line 45), wherein at least a portion of the second pattern substantially defines a \second part of the functional feature of the product unit (Example II, distributed capacitance);

exposing both sides of the web to an etchant ("etching" col.11, line 43) to effect removal of metal-containing material from areas of the web not protected by the first and second etch-resistant patterns.

Reilly fails to disclose that the etching is "wet" etching and also fails to disclose washing the etchant from the web.

Beckett teaches that a useful method to pattern a metal layer 12 on a flexible substrate 14 includes wet etching 28, followed by washing 56.

Lichtblau also teaches that etching is useful for patterning metal layers on flexible webs.

Lichtblau teaches a method for demetallizing a web comprising:

exposing both sides of the web 44 to a liquid etchant (by passing the web 98 through a continuous spray etching apparatus 100) to effect removal of metal-containing material from areas of the web not protected by the first and second etch-resistant patterns; and

washing the etchant from the web (with water rinse apparatus 112).

It would have been obvious to pattern by wet etching followed by washing in the method of Reilly because Beckett and Lichtblau teach that to do so is useful for patterning metal layers on flexible substrates.

As to claims 26 and 27, Beckett teaches to use either an etch bath 28 or spraying (col.10, lines 31-36). Lichtblau teaches to spray etchant 100.

As to claim 28, Beckett teaches to use sodium hydroxide-resistant materials (col.4, lines 19-20, 48-50) and NaOH bath 36.

As to claim 29, Reilly discloses that the first and second metal layers are of equivalent thicknesses (2 mils, col.11, line 45).

As to claim 30, Reilly discloses that the portions are symmetrical and in registration (Fig.6-8).

As to claims 31, 42 and 52, Reilly discloses to electrically connect the first and second parts (col.9, lines 35-37; for example, by using a pin 34).

As to claims 32-33, 39 and 49, Reilly discloses apportioning since the thicknesses are predetermined (by choosing 2 mils) and are the same on both sides of the flexible substrate.

As to claim 34, Reilly refers to the prior art in Figure 1, for which it is known (as taught by Lichtblau, col.4, lines 29-31) that the thicknesses may be different to design desired electrical characteristics. It would have been obvious to have different thicknesses in the method of Reilly since Reilly teaches that the prior method, as taught by Lichtblau, is a known method for forming electrical products.

As to claims 35-37, see the rejection of claims 26, 27 and 30.

As to claim 38, Beckett teaches to use a spindle (Fig.1), which is obvious to use in the method of Reilly in order to facilitate handling of the substrate.

Claims 41 and 51 are rejected under 35 U.S.C. 103(a) as being unpatentable over Reilly et al (US 4,583,099) in view of Beckett (US 5,340,436), Lichtblau (US 3,913,219) and George (US 3,764,459).

The discussion of modified Reilly from above is repeated here.

As to claims 41, and 51, Reilly discloses that the metal layers are joined electrically around the substrate 69 (col.9, lines 35-37), but does not explicitly disclose that the layers are crimped together.

George teaches that metal layers (aluminum) that extend from a substrate (such as paper or polymers, col.3, lines 50-55) may be joined electrically by crimping (col.5, lines 29-32).

It would have been obvious to crimp to electrically join in the method of Reilly because George teaches that crimping is a known, useful method for electrically joining metal layers with an intervening substrate.

Response to Amendment

The rejection of claims 25 and 27 under 35 U.S.C. 103(a) as being unpatentable over Adachi (US 5,003,610) in view of Appalucci et al (EP 794 520 A1) and Lichtblau (US 3,913,219); and the rejection of claims 26, 28-31 under 35 U.S.C. 103(a) as being unpatentable over Adachi in view of Appalucci et al (EP 794 520 A1) and Lichtblau (3,913,219) as applied to claim 25 and further in view of Graham et al (GB 540542 A) are withdrawn in view of the amendment that the substrate consists essentially of a polymer film. Adachi has a foamed mica plate, not a flexible substrate, in the embodiment of Figure 4.

However, an updated search revealed Reilly, which discloses a method with a flexible substrate with aluminum layers that are etched to form an electrical product. The metal layers are also electrically joined or fastened, as discussed above in the rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Anita K. Alanko whose telephone number is 571-272-1458. The examiner can normally be reached on Mon-Fri until 3:30 pm.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Nadine Norton can be reached on 571-272-1465. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Anita K Alanko/
Primary Examiner
Art Unit 1792